

## **In the Claims**

Claims 1-71 (cancelled).

Claim 72 (new): An ion trap mass spectrometer comprising:

a vacuum chamber housing comprising a lid and a base, the lid and the base defining a vacuum chamber volume, and the base comprising at least one wall configured to couple with the lid, wherein the lid comprises:

an interior surface configured to define an interior wall of the vacuum chamber and an exterior surface configured to couple with an analysis component; and

a first opening extending through the lid from the analysis component to the interior surface;

an ion trap mass separation component coupled to the interior surface of the lid without being coupled to the base and configured to perform at least some operations with respect to mass separation for use in mass spectrometry, wherein the first opening provides fluid communication between the ion trap and the analysis component;

wherein the lid is configured to be removably operably coupled with respect to the base and positioned in a first operable position to seal with the base and provide the ion trap component wholly within the vacuum chamber volume, and a second position to decouple the lid and all analysis components coupled to the lid from the base and provide the ion trap component wholly outside the vacuum chamber volume.

Claim 73 (new): The spectrometer of claim 72 further comprising:  
at least one edge of the lid extending between the interior and exterior surfaces and defining a perimeter of the lid; and  
a second opening extending from the edge through the lid to the first opening.

Claim 74 (new): The spectrometer of claim 73 wherein the second opening is configured to receive sample for analysis.

Claim 75 (new): The spectrometer of claim 72 wherein the analysis component comprises an ion source component configured to perform at least some operations with respect to providing ions for use in mass spectrometry.

Claim 76 (new): The spectrometer of claim 75 further comprising a sample inlet component coupled to the interior wall of the lid and the ion trap component, the sample inlet component being operably configured to expose sample to ions received from the ion source component coupled to the exterior surface of the lid.

Claim 77 (new): The spectrometer of claim 76 wherein the sample inlet component comprises a semi-permeable membrane.